

Directorate of Town & Country Planning, Haryana

Yojana Bhavan, Plot No. 3, Sector 18 A, Madhya Marg, Chandigarh

Phone: 0172-2549349 e-mail:tcpharyana7@gmail.com

website:-http://tcpharyana.gov.in

Regd.
To

Aarize Township LLP,
Unit No. 507, 5th Floor, Spaze Boulevard,
Sector 47, Gurugram-122002.

Memo No. LC-5352/JE (SB)/2026/ 23987 Dated: 07-07-26

Subject: Approval of Service Plan/Estimates in respect of Licence No. 206 of 2025 dated 15.10.2025 granted for setting up Affordable Residential Plotted Colony under DDJAY Policy-2016 over an area measuring 9.4166 acres in the revenue estate of village Karnal, Sector-34, Karnal.

Reference: Chief Administrator, HSVP, Panchkula office memo no. 196891 dated 02.07.2026.

The Service Plan/Estimates in respect of Licence No. 206 of 2025 dated 15.10.2025 granted for setting up Affordable Residential Plotted Colony under DDJAY Policy-2016 over an area measuring 9.4166 acres in the revenue estate of village Karnal, Sector-34, Karnal are hereby approved subject to the following terms & conditions: -

1. That you will abide by all the conditions and notes mentioned in the Service Plan Estimates of the subject cited colony contained in the Chief Administrator, HSVP, Panchkula office memo dated 02.07.2026 (copy enclosed).
2. That you will have to pay the proportionate cost to the External Development Charges for setting up Affordable Residential Plotted Colony for the services like water supply, sewerage, storm water drainage, roads, bridges, community building, street lighting, horticulture and maintenance thereof etc. on gross acreage basis as and when determined by HSVP. These charges will be modifiable as and when approved by the authority/State Govt. and will be binding upon the colonizer.
3. The category wise area shown on the plans and proposed density of population thereof has been treated to be correct for the purpose of services only.
4. That you shall be responsible for maintenance and upkeep of all roads, open spaces, public parks and public health services for a period of five years from the date of issue of the completion certificate under rule 16 unless earlier relieved of this responsibility and there upon to transfer all such roads, open spaces, public parks and public health services free of cost to the Government or the local authority, as the case may be.
5. The wiring system of street lighting will be under ground and the specifications of the street lighting fixture etc. will be as per relevant standard of HVPNL. LED lamps shall be provided to meet the requirement of HVPNL and as well environment.

For AARIZE TOWNSHIP LLP


Authorised Signatory

6. It is made clear that appropriate provision for fire-fighting arrangement as required in the NBC/ISI shall also be provided by you and fire safety certificate shall also be obtained from the competent authority before undertaking any construction. You shall be solely responsible for fire safety arrangement.
7. All technical notes and comments incorporated in the estimates in two sets will also be applicable. A copy of these is also appended as Annexure-A.

Note (1):-

That you shall execute the development works as per Environmental Clearance and comply with the provisions of Environment Protection Act, 1986, The Air (Prevention and Control of Pollution) Act, 1981 and The Water (Prevention and Control of Pollution) Act, 1974. In case of any violation of the provisions of said statutes, you shall be liable for penal action by Haryana State Pollution Control Board or any other Authority Administering the said Acts.

A copy of the approved revised service plan/estimates is enclosed herewith. You are requested to supply three additional copies of the approved service plan/estimates to the Chief Administrator, HSVP, Panchkula under intimation to this office.
DA/As Above.


(Babita Gupta)

District Town Planner
For Director, Town & Country Planning
Haryana, Chandigarh
Dated:

Endst. No LC-5352/JE(SB)/2026/

A copy is forwarded to the following for information and necessary action please:-

1. The Chief Administrator, HSVP, Panchkula with reference to their office memo no. CA-HSVP/ CE-I/ ACE(HQ)/ EE(M)/ SDE(W-3)/ 2026/196891 dated 02.07.2026.
2. Senior Town Planner, Panchkula.
3. District Town Planner, Karnal.


(Babita Gupta)

District Town Planner
For Director, Town & Country Planning
Haryana, Chandigarh

For AARIZE TOWNSHIP LLP


Authorised Signatory

**PROPOSED AFFORDABLE RESIDENTIAL
PLOTTED COLONY UNDER DDJAY-2016
OVER AN AREA MEASURING
9.4166 ACRES SITUATED IN THE REVENUE
ESTATE OF VILLAGE KARNAL,
SECTOR - 34, KARNAL**

**SERVICE PLAN ESTIMATE
FOR
PUBLIC HEALTH ENGINEERING SERVICES WORK**

Client

AARIZE TOWNSHIP LLP.

For AARIZE TOWNSHIP LLP

ARCHITECT

ACPL DESIGN LTD.

E-24 SOUTH EXTENSION -1, NEW DELHI 110049. INDIA


Authorised Signatory

For AARIZE TOWNSHIP LLP

MEP SERVICES CONSULTANT

PARADISE CONSULTANTS

PLOT 129, POCKET 2, NEAR SANJIVANI HOSPITAL, JASOLA VIHAR, NEW DELHI-25


Authorised Signatory

PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

PROJECT REPORT / ESTIMATES FOR PROVIDING INTERNAL SERVICES e.g. WATER SUPPLY, FIRE, SEWERAGE & STORM WATER DRAINAGE ETC. IN RESPECT OF PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

Karnal district lies on the western bank of the river Yamuna, which forms its eastern boundary and separates Haryana from Uttar Pradesh. Karnal District, including Panipat, Its height above sea level is around 250 meters. The district has an area of 1,967 km² and its population is 1,274,183 (2001 census). Karnal District is bordered by Kurukshetra District on its north-west, Jind & Kaithal Districts on its west, Panipat District on its south and Uttar Pradesh state on the east. The district is a part of the Indus-Ganges plain and has a well-spread network of western Yamuna canals. Its geographical area has been divided into three agroclimatic regions: Khadar, Bangar and Nardak belt. Khadar starts from the Indri-Karnal road one mile away from Karnal covering the area between the Yamuna river and National Highway 1 up to Patti-Kalyana village. Bangar area starts from west of Khadar area covering Gharaunda development block. The Nardak area lies in Nissing, Nilokheri and Assandh development block. However, its water is saline and not fit for irrigation. Karnal district is divided into two sub-divisions: Karnal and Assandh. Karnal sub-division is divided into 4 tehsils: Karnal, Nilokheri, Indri and Gharaunda and 2 sub-tehsils: Nissing and Nigdu. Assandh sub-division comprises a lone tehsil, Assandh and a lone sub-tehsil, Ballah.

PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL BEING DEVELOPED AARIZE TOWNSHIP LLP.

1 Water Supply

The source of water supply shall be HUDA water supply connection. It has been proposed to construct underground tanks of capacity as per attached detailed for domestic and other purpose. The underground tanks will be filled up from the riser and then pumped to the overhead water tanks of each plot.

i.) Source

The source of water supply in this area is tubewells as the underground water is sweet and fit for human consumption, moreover, the water is available at reasonable depth. The average yield of tubewell about 25000 lph per hour. The recharging of under ground water table in this belt is stated to be good. However still we shall resort to rain water harvesting system to keep up the recharging system. The number of tubewells required for the above area has been worked out to 02 Nos and the tubewells will be bored in tune with growth of demand to avoid absolution of the tubewells.

ii.) Design

The scheme has been designed for population of 2790 persons in 9.4166 Acre. The rate of water supply per head per day has been taken assumed as 155.25 litres per head per day as per HUDA norms. In addition to above necessary provision of water for Community building, Commercial building, parks etc. have been taken into account for calculating the maximum number of tubewell water required.

iii.) Pumping Equipments

It has been proposed to install pumping set as described with standby of equal capacity. The provision for standby generating set has been provided in case of any electricity failure. Generator will be provided separately or added to the capacity of main generator.

iv.) Under Ground Storage

Underground storage tank provision has been made, which caters for the present and a lot of future requirement as well as fire fighting requirement. The water for domestic water compartment shall over flow from the fire compartment so that the water in the fire compartment also remains fresh.

v.) Boosting Station

The boosting station is being planned near UGSR catering to the above requirement.



PARADISE CONSULTANTS

For AARIZE TOWNSHIP LLP

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PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

vi.) Distribution System

The distribution systems for this development are has been designed to supply @ 155.25 Litres per head per day @ 3 times the average rate of flow on 'Hazen Willima' formula with C-100. Necessary provision for laying D.I. pipes only conforming to relevant IS standards along with valves and specials has been made in this estimate. The minimum terminal head at any point in this system will be about 21.00 metres so that it can serve the S+4 stories construction envisaged in the plan. Minimum pipe diameters for distribution are kept as 100 dia.

vii.) Rising Mains

Rising mains from HUDA water main on sector road to water works have also been designed and provision for D.I. pipe line (dia as/design) has been made in this estimate.

2 Sewerage

This scheme is designed for sewer connecting to the proposed sewage treatment plant. The sewerage system has been marked on the respective plans.

The sewer lines have been designed for 3 times average DWR in relation to the water supply demand assuming that 80% fo the domestic water supply shall find its way into the proposed sewer SW pipe sewers have been proposed designed to run half full. The sewers have been designed on 0.75 mtr. per second velocity ie. Self cleansing velocity. Necessary provisions for laying SW pipes manholes etc. has been made in this estimate.

Necessary design statement for entire sewerage system has been prepared and attached with estimate.

3 Storm Water Drainage

The storm water drain is being designed to carry 35 mm rain fall per hour. Also suitable provisions are contemplated in our scheme to ensure better recharging of under ground water table in the area. RCC NP₃ pipe drain with minimum 400 mm dia is proposed in this area.

4 Roads

Cost of road has been taken in the estimate.

5 Street Lighting

Provision for street lighting on surrounding area has been made.

5 Horticulture

Estimates and details of plantation, landscaping, signage etc. has been included.

7 Specifications :

The work will be carried out in accordance with the standard specifications of PH as laid down by the HUDA/Haryana Government.

8 Rates

Estimates for providing services in this site has been prepared on the recent HUDA rates.

9 Cost

The total cost of development in this Project including various PH & B & R services works out to Rs. ~~853.42~~ ^{1071.87} lacs which includes 3% contingency and PE charges and 49% departmental charges also.

The cost per gross acre for this phase works out to Rs. ~~90.63~~ ^{113.83} Lacs/acre which covers the provision of services like water supply, sewerage, storm water drainage, roads, street lighting and plantations including plantations maintenance thereof as well as future expansion whatsoever indicated.

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For AARIZE TOWNSHIP LLP

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For AARIZE TOWNSHIP LLP

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**PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN
AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE
KARNAL, SECTOR - 34, KARNAL**

DESIGN CALCULATION

1 Plots

Total No. of Plots 155 Nos.
Population per plot 18.0 persons
Therefore population 2790 persons

SAY 2790 persons

Water requirement for plots (General) @ 155.25 Lpd. (135 + 15%)
Domestic @ 65 % Flushing @ 35 %
Water requirement for plots (General) @ 101.00 54.25 Lpd.
281790 151358 Lpd.
or 281.79 151.36 Kld.

2 Visitors @ 10%

Water requirement @ 15.00 Lpd.
Domestic Flushing
Water requirement @ 5.00 10.00 Lpd.
1395 2790 Lpd.
or 1.40 2.79 Kld.

3 Commercial (Acres)

Daily water requirement @ 32000 lit/Acre 0.376 32000
Including Milk & veg. booth in commercial as/site @ 20800 11200.00 Lpd.
7820.8 4211.2 Lpd.
7.82 4.21 Kld.

4 Community Facility (Acres)

Daily water requirement @ 25000 lit/Acre 0.942 25000
@ 16250 8750.00 Lpd.
15307.5 8242.5 Lpd.
15.31 8.24 Kld.

5 misc.

6 Total water Requirement (1+2+3+4)

7 Green area (Acres)

Daily water requirement @ 25000 lit/Acre 0.702 25000 Ltr./Acre
17830.00 Lpd.
17.80 17.65 Kld.
2.34 Area @ 5000 Ltr./Acre
11.70 29.50 say 30 KL

I Total Daily Requirement

a) For Domestic+Flushing use (1+2+3+4) 312 306.31 166.60 Kld.

b) Green Area 0.00 17.65 Kld.

Total Daily Requirement 306.31 184.25 Kld.

SAY 312.0 197.0 200 Kld.

II Tubewell

Assuming working hours of tubewells 8 Hours

Assuming discharge/hour of each tubewell 25 KL/Hours

Total domestic demand 312 306.31 Kld.

No. of tubewells required 1.56 2.00 Nos.

For AARIZE TOWNSHIP LLP

Authorised Signatory 312

306.31 /25/8

Say

For AARIZE TOWNSHIP LLP

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PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

III Pumping machinery for tubewell

Gross working load	=	70.00 Mtr.
Average fall in SL	=	3.05 Mtr.
Depression head	=	6.10 Mtr.
Friction loss in main	=	2.50 Mtr.
	=	81.65 Mtr.
Say	=	85.00 Mtr.
BHP = $25000 \times 85 \times 1 / 60 / 60 / 75 / 0.6$	=	13.12 HP
With 60% efficiency	Say	15.00 HP

IV Underground Tank

Daily requirement for domestic use	=	312.00 Kld.
Capacity of under ground tank		
14 hours storage (60%)	312×0.60 $306.31 \times 16 / 24$	187.20 204.21 Kld.
Say	=	200 220.00 Kld.
Daily requirement for Flushing use	=	2.00 166.60 Kld.
Capacity of under ground tank		
14 hours storage (60%)	200×0.60 $166.60 \times 16 / 24$	120.00 111.07 Kld.
Say	=	120.00 Kld.
Fire Tank Capacity As/NBC Code $100 \sqrt{P} = 100 \sqrt{1.566} \times 1/3$	=	55.67 83.52 KLD
Say	=	100.00 KLD
TOTAL (Dom.+ Fire)		300 320.00 KLD

It is proposed to provide under ground tank of capacity **300 KL** which also includes **100 KL** capacity for fire fighting.

Tanks will have six compartments, two for fire, two for raw and the other two for domestic use. The water first enters the fire compartment, then over flows to the raw use compartment so that the water in the fire compartment shall remain fresh.

It is proposed to provide the under ground tank of following capacity :

Capacity of Fire Water Tank-01	50.00 Kld.
Capacity of Fire Water Tank-02	50.00 Kld.
Capacity of Raw Water Tank-01	50.00 Kld.
Capacity of Raw Water Tank-02	50.00 Kld.
Capacity of Domestic Water Tank-01	50.00 Kld.
Capacity of Domestic Water Tank-02	50.00 Kld.
Capacity of Flushing Water Tank-01 (Location at STP)	60.00 Kld.
Capacity of Flushing Water Tank-02 (Location at STP)	60.00 Kld.
	UGT

V BOOSTING MACHINERY

UG. Tank

Daily requirement for domestic use	=	312.00 Kld.
Assuming 6 hours pumping	2 pumps (with one standby)	26.00
Discharge/hour	$306.31 / 6 / 2 =$	25.53 KL/Hours
Head of pump	312	or 433.33 GPM
i) Suction lifts	=	0.0 Mtr. Say 450 GPM
ii) Friction loss in M<main & specials	=	4.0 Mtr.
iii) Clear head	=	30.0 Mtr.
iv) Residual head	=	5.0 Mtr.
	=	39.0 Mtr.
BHP of motor	450×40 $60 \times 75 \times 0.60$	Say 40 6.67 5.51 HP 6.0 HP

For AARIZE TOWNSHIP LLP

Authorised Signatory

For AARIZE TOWNSHIP LLP



Authorised Signatory



PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

Daily requirement for flushing use	=	800.166.60 Kld.
Assuming 8 hours pumping	2 pump (with one standby)	
Discharge/hour	$\frac{166.60}{6/1}$	27.77 KL/Hours
Head of pump	200/8/2	16.66 or 277.37
i) Suction lifts	=	0.0 Mtr. Say 300
ii) Friction loss in M<main & specials	=	4.0 Mtr.
iii) Clear head	=	30.0 Mtr.
iv) Residual head	=	5.0 Mtr.
	=	40.0 Mtr.
BHP of motor	$\frac{300 \times 40}{60 \times 75 \times 0.60}$	4.4 HP 6.0 HP 5.0
Gen Set	Nos. HP	
Pumps for UG. Tank (Domestic)	2 7.5	15 HP
Pumps for UG. Tank (Flushing)	2 5.0	10 HP
Tubewell	2 15.0	30 HP
Lighting		25 HP
		80 HP
or	80 71 x 0.746 x 1.5	89.52 79.45 KVA
	Say	80.00 KVA
		100.0
VI Sewage Treatment Plant Capacity (STP.)		
Gross Domestic+Flushing water requirement / day		479.0 472.91 Kld.
Sewage flow (80% domestic + 100% flushing) of total load	249.60 + 167.0	417.60 411.65 Kld.
Proposed STP. Capacity		420.00 Kld. ✓ STP



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For AARIZE TOWNSHIP LLP

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For AARIZE TOWNSHIP LLP

PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

Estimate for Providing in Internal Development works for

AARIZE TOWNSHIP LLP.

Description	Amount (Lacs.)
Sub Work - I Water Supply Scheme	247.48
Sub Work - II Sewerage Scheme	156.87
Sub Work - III Storm Water Drainage Scheme	109.73
Sub Work - IV Roads & Footpath	244.45
Sub Work - V Street Lighting	36.13
Sub Work - VI - Horticulture	8.56
Sub Work - VII - Maintenance of Services for 10 years including resurfacing of roads after 1st 5 years & II phase i.e. 10 years of maintenance (as per HUDA norms)	268.65

Total 1071.87

COST PER ACRE $\frac{\text{Rs. 1071.87 Lacs}}{9.4166 \text{ Acre}} = \text{Rs. 113.83 Lacs}$

AARIZE TOWNSHIP LLP.

For AARIZE TOWNSHIP LLP

Authorized Signatory
Authorized Signatory

Superintending Engineer
HSVP Circle, KARNAL

Executive Engineer
HSVP Division Karnal



PARADISE CONSULTANTS

For AARIZE TOWNSHIP LLP

Authorized Signatory

For AARIZE TOWNSHIP LLP

Authorized Signatory

Checked subject to Comments
In forwarding letter No. 196891
Dt. 02/07/2026 and notes
Attached with the estimate

Executive Engineer (M)
for Chief Engineer-I
HSVP, Panchkula

Director
Town & Country Planning
Haryana, Chandigarh



हरियाणा शहरी विकास प्राधिकरण

HARYANA SHEHARI
VIKAS PRADHIKARAN

Tel. : 2570982
Toll Free No. : 1800-180-3030
Website : www.hsvp.in
Email : cencrhuda@gmail.com

Address: C-3, HSVP, HQ Sector-6
Panchkula

C.E.I-No. 196891
Dated: 02/07/2024
Annexure-A

SUB:-

Request for approval of service plan estimate for providing water supply, sewerage, storm water drainage scheme, construction of roads, street lighting, Horticulture works maintenance of roads and public health services in the Affordable Residential Plotted Colony (under DDJAY-2016) over an area measuring 9.4166 acres (licence no. 206 of 2025 dated 15.10.2025) in the revenue estate of Karnal, Sector-34, Distt. Karnal being developed by M/s Aarize Township LLP.

Technical note and comments:-

1. All detailed working drawings would have to be prepared by the colonizer for Integrating the internal services proposals with the master proposals of town.
2. The correctness of the levels will be the sole, responsibility of the colonizer for the integration of internal proposals, with the master proposals, of town and will be got confirmed before execution.
3. The material to be used shall the same specifications as are being adopted by HSVP and further shall also confirm to such directions, as issued by Chief Engineer, HSVP from time to time.
4. The work shall be carried out according to Haryana PWD specification or such specifications as are being followed by HSVP. Further it shall also confirm to such other directions, as are issued by Chief Engineer, HSVP from time to time.
5. The colonizer will be fully responsible to meet the demand of water supply and allied services till such time these are made available by State Government/ HSVP. All link connections with the State Government/ HSVP system and services will be done by the colonizer. If necessary extra tube-wells shall also be installed to meet extra demand of water beyond the provision according to EDC deposited.
6. Structural design & drawings of all the structures, such as pump chamber, boosting chamber, RCC OHSR underground tanks quarters, manholes chamber, sections of RCC pipes sewer and SW pipes, sewer, ventilating shafts for sewerage and Masonry Ventilation Chamber for Chamber for storm water drainage, temporary disposal/ arrangement etc. will be as per relevant I.S codes and PWD specifications; colonizer himself will be responsible for structural stability of all structures.
7. Potability of water will be checked and confirmed and the tube-wells will be put into operation after getting chemical analysis of water tested.

For AARIZE TOWNSHIP LLP


Authorised Signatory



हरियाणा शहरी विकास प्राधिकरण

**HARYANA SHEHARI
VIKAS PRADHIKARAN**

Tel. : 2570982
Toll Free No. : 1800-180-3030
Website : www.hsvp.in
Email : cencrhuda@gmail.com

**Address: C-3, HSVP, HQ Sector-6
Panchkula**

8. Only D.I pipes will be used in water supply and flushing system, UPVC/ HDPE pipe for irrigation purposes.
9. A minimum 100 & 150mm i/d/D.I (K-7), 200mm i/d SW and 400mm id RCC NP-3 pipes will be used for water supply, sewerage and storm water drainage respectively.
10. Standard X-section for S.W. pipes sewer, RCC pipes sewer etc. will be followed as are being adopted in Haryana Public Health Engineering Deptt. or HSVP. If needed, the same may be sought by the colonizer from concerned Executive Engineer of HSVP.
11. The developer may be directed to get the Sewage Treatment Plant (STP) got designed from a Govt. Institute like IIT, NIT etc. so as to ensure that the technology adopted by him is appropriate. He must take this action before construction of STP and submit documentary proof for the same at the time of grant of occupation certificate. The efficacy of such STP shall be checked randomly by the concerned Regional Officer of HSPCB.
12. The X-section, width of roads, will be followed as approved by the Chief Town Planner, Haryana, Chandigarh. The kerbs and channels will also be provided as per approved X-section and specifications. If needed, the same may be sought by the colonizer from concerned Executive Engineer of HSVP.
13. The specifications for various roads will be followed as per IRC/MORTH specifications.
14. The wiring system of street lighting and specifications of street lighting fixture will be as per relevant standards.
15. This shall confirm to such other conditions as are incorporated in the approved estimate and the letter of approval.


Executive Engineer (M),
For Chief Administrator, HSVP,
Panchkula.

For AARIZE TOWNSHIP LLP


Authorised Signatory

PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

FINAL ABSTRACT OF REVISED COST

Description	Amount (Lacs.)
Sub Head - (I) Head Works	₹ 82.60 40.40 lacs
Sub Head - (II) Pumping Machinery	₹ 36.50 27.10
Sub Head - (III) Distribution System (Domestic + Flushing) + <i>Rising main</i>	₹ 39.64 31.38
Sub Head - (IV) Irrigation Scheme	₹ 2.52 2.23
	<u>161.26</u> lacs
	101.11
Total	
Add 3% Contingencies	4.84 3.03 lacs
	<u>166.10</u> lacs
	104.15
Total	
Add 49% Departmental Charges	81.38 31.03 lacs
	<u>247.48</u> lacs
	155.18
Grand Total	
	₹ 247.48 lacs
	155.18
(CO to final abstract of cost)	Say



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For AARIZE TOWNSHIP LLP

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PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

Sub Work I Sub Head No. I				Water Supply Head Works	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount Rs. (lacs)
1	Boring and installing 510 mm i/d tubewells with reverse/direct rotary rig complete with pipe strainer to a depth of about 80 m. complete.	Nos.	2	1500000 4000000.00	30.00 20.00
2	Constructing pump chambers as per standard design of PWD PH/HUDA of size 1.50x1.50 m.	Nos.	2	150000 100000.00 1.00	2.00 3.00 2.00
3	Construction of boosting chambers of suitable size along with under ground tank & pumping machinery and generating set etc. complete in all respects.				
Details of boosting station					
i)	construction of boosting chambers	Nos.	1	400000.00	4.00
ii)	construction of UG tank (Dom.+ Fire) (200+100) to 120 KL cap. + 120 KL water tank near STP 300+120 = 420 KL	KL	320 420 (420)	4500.00 5500	14.40 23.10 17.60
4	Provision for carriage of material and other unforeseen items.	LS	-	-	2.50 0.50
5	Provision of special for tube wells & rising main to UGT				0.50
6.	Provision for boundary wall around T.W. & UGT			(L.S.)	3.00
7.	Provision for footpath & drains around water works T.W.			(L.S.)	2.00
	(C.O. to abstract of cost of Sub-work No.I)				54.60
8	Provision for staff costs for etc. 2 nos 3500			(L.S.) Say	15.00
					40.40 Lacs 54.60 82.60 lacs



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For AARIZE TOWNSHIP LLP

Authorised Signatory



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PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

Sub Work I		Water Supply			
Sub Head No. II		Pumping Machinery			
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (in Lakhs)
1	Providing and installing electricity driven electro or submersible pumping set capable of delivering about 25 KL water per hour against a total head of 8.0 M complete with motor and other accessories. (15.0 HP)	Nos.	2	300000.00	6.00
2	Providing & installing electricity driven pumping set capable of delivering 450 LPM of water against a total head of 4.5 m complete with motor and other accessories (For Domestic - 6.0 HP). 7.50	Nos.	3 (2+1)	150000.00	4.50 5.40
3	Providing & installing electricity driven pumping set capable of delivering 300 LPM of water against a total head of 4.5 m complete with motor and other accessories (For Flushing - 6.0 HP). 5.0	Nos.	3 (2+1)	100000.00	3.0 3.40
4	Provision for diesel engine generator set each for standby Arrangements for booster pump complete with gear haed arrangements of following capacities.				
i)	100 KVA	KVA	100	15000.00	15.0 9.60
5	Provision for cheap pressure type chlorination plant complete.	Nos.	1	100000.00	1.00
6	Provision for making foundations & erection of pumping machinery.	LS	-	-	2.00
7	Provision for pipes, valves & specials inside the pump chamber.	LS	-	-	1.50
8	Provision for electric services connection including electric fittings for tubewells chambers complete including cost of transformer.	LS	-	-	2.50 1.00
9	Provision for carriage for materials and other unforeseen items.	LS	-	-	1.00
(C.O. to abstract of cost of Sub-work No.I)				Total	36.50 27.10
				Say	27.10

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PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

Sub Work I			Water Supply		
Sub Head No. III			Distribution System/Rising Main		
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, laying, jointing & testing D.I. K-7 pipes including cost of excavation complete as per ISI marked. (For Domestic, Flushing & Tube Well water supply line)				
i)	100 mm dia <i>(Including flushing line)</i>	M	1883 1830	1250.00 1425	2353750.00 2777425 26.99
ii)	150 mm dia	M	48 48	1575.00 2040	15750.00 20400 0.62
2	Providing, fixing & Testing butterfly valves including cost of complete in all respects.				
i)	100 mm i/d	Nos.	15 Nos.	12000.00	180000.00
	<i>150 mm d</i>	<i>Ni</i>	<i>234</i>	<i>1500</i>	<i>0.30 lacs</i>
3	Providing, fixing & Testing Non Return valves (NRV) including cost of complete in all respects.				
i)	100 mm i/d	Nos.	3	15000.00	45000.00
4	Providing and fixing air valves and scour valves including cost of complete in all respects.	Nos.	6	10000.00	60000.00
5	Providing and fixing indicating plates for sluice valve, air valve etc.	Nos.	26	1000.00	26000.00
6	Provision for carriage of material	LS	-	-	200000.00
7	Provision for cutting the roads and making to its original conditions.	LS	-	-	200000.00
8	Making water supply connection. <i>with 1500 main</i>	LS	-	-	200000.00
9	Provision for rising main from <i>MC</i> UG Tank water supply line to UG Tank.				
i)	100 mm i/d	M	130	1250.00 1475	162500.00 191750
(C.O. to abstract of cost of Sub-work No.I)				Total	-3138000.00
				Say	31.38 Lacs



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Sub Work I

Sub Head No. IV

Water Supply

Irrigation Scheme

S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, laying, jointing & testing uPVC pipe line confirming to IS 4985 including cost of Excavation etc. complete in all respect. (Note:- For garden hydrants tapoff from flushing water supply line)				
i)	25 OD (tapoff from flushing water supply line)	M	200	240.00	48000.00
i)	50 OD (tapoff from flushing water supply line)	M	75	450.00	33750.00
2	Providing and fixing 20 mm PVC RQRC hydrant valve with PVC lid and PVC Keys for hydrant valve complete in all respect.	Nos.	19	5000 3500.00	66500.00 0.95195
3	Provision for carriage of materials etc. and other unforeseen charges.	LS	-	-	50000.00
4	Provision for cutting of roads & making good to its in original condition.	LS	-	-	25000.00
Total					223250.00 2.52 lacs
Say					2.23 Lacs 2.52 lacs



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Sub Work - III

Storm Water Drain

S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing, lowering, jointing, cutting RCC NP ₃ pipes and specials into trenches including cost of excavation cost of manholes, ventilating chambers etc. complete in all respects.				
i)	400 mm i/d				24.40 lacs
a)	Average depth upto 1.5 m	M	976	2500.00	2430000.00
b)	Average depth 1.5 m to 4.5 m	M	4	2600.00	10400.00
2	Provision for Road Gully & Drain. <i>pipe 300mm</i>	LS	-	-	300000.00
3	Provision for cutting of roads and carriage of materials etc. and other unforeseen items	LS	-	-	50000.00
4	Provision for <i>disposal</i> arrangements Recharge Pit.	Nos	7	350000 250000.00	2450000 1000000.00
5	Provision for lighting, watching and temporary diversion of traffic	LS	-	-	500000.00
6	Provision for connection with HUDA. <i>main lin</i>			(L.S.)	2.1
i)	400 mm i/d (Average depth upto 1.5 m)	M	50	2500.00	125000.00
7. Prov. for Temporary Disposal arrangements till durp Sample are provide (L.S.)					10.0 lacs
Add 3% contingencies					54654.00
Add 49% Deptt. Charges					163962.00
Total					109.77 lacs
SAY					61.62 Lacs
(C.O. to abstract of cost of Sub-work No. 1					83.88



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Sub Work IV				Road Work	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Provision for leveling & earth filling as per site condition 9.4166 acre @ 150000/acre	Acres	9.4166	150000 1.75 lacs	1412490.00 16.48 lacs
2	Construction of (mettalled) road by:- i) Providing GSB 200 mm thick. ii) 250 mm thick W.M.M. stone aggregate. iii) 50 mm thick DDM DBM iv) 30 mm thick BC complete in all respect.	Sq. mtr.	5950 6160.0	1750 1200	16780000 7392000.00 104.13 lacs
3	Provision for making approach and pavement to building block by providing concrete pavement or tiles-Etc. In Comm. Area i.e. 50% of the area 1521.80 Sqm/2 = 760.90 Sqm	Sq. mtr.	765 3773.00	1750 L	13.39 lacs 2829750.00
4	Provision for parking arrangement.	LS.	-	-	200000.00
5	Provision for kerb stone with complete specification. both side of Road	mtr.	2156.0	700 600	1509200 1293600.00
6	Provision for Carriage of material to office compound		(6.5)	-	30000.00
7	Provision for traffic lighting and guide map/ indicators	LS.	-	-	500000.00
				Total	159.09 lacs 16781440.00 4.77 lacs 503443.20 995335.20 163.86 17294883.20 80.29 13573175.20 244.15 135.73 8467592.76 25754475.96 66.54 Lacs
Add 3% contingencies				Total	25754475.96 66.54 Lacs
Add 49 % department charges				SAY	257.55 202.24 Lacs

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Sub Work V				Street Lighting	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Providing street lighting on internal (mettaled) roads as per standard specifications of HVPNL with CFL	per acre	9.4166	250000.00	2354150.00
	Add 3% contingencies				70624.50
				Total	2424774.50
	Add 49% Deptt. Charges				1188139.51
				Total	3612914.00
				SAY	Rs. 36.13 Lacs

C.O. to final abstract of cost



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Sub Work VI

Horticulture

S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Development of lawn area				
	a) Trenching the ordinary soil upto depth of 60 cm. Including removal & packing of serviceable material & disposing at a lead of 50 M and making up the trenched area to proper level by filling with earth mixed with manure before & after flooding trench with water including cost of imported earth & manure.				
	b) Rough dressing of trenched area.				
	c) Grassing including watering & maintenance of lawns free from weeds & fit for mowing in rows including hedges, shrubs & green belts (as per HUDA Norms)				
	9.4166 acres @ Rs. 2.5 lacs	per acre	6.712	200000	1.42
	70 trees @ Rs. 1300/- each		9.4166	150000.00	14,12,490
	180				1883320
	23107				91,000
	1078/12/2 = 179.66				161700
	Say 180 Nos				4.16 lacs
	Add 3% contingency charges				5.58
	Add 49% Deptt. Charges				0.17
					5.75
					2.81
					8.56 lacs
					3029990
					23.07 Lacs
					31.39

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Sub Work VII				Maintenance Charges & Resurfacing of Roads	
S. No.	Description	Unit	Qty	Rate (Rs.)	Amount (Rs.)
1	Provision for maintenance charges for water supply, sewerage, storm water drainage, roads, street light, horticulture etc. complete including operation & establishments charges as per HUDA norms after completion & resurfacing of roads after 10 years or 1st phase.				
	9.4166 acres @ 8 lacs per acre	per acre	9.4166	800000.00	7533280 75.33
2	Provision for resurfacing & strengthening of road (with 50mm thick BM + 50 mm thick BC) after five years of Ist phase @ 600/- per sqm	Sq. mtr.	6160.0 5950	660 660	3696000.00 4065600
		+ Comm.	765 765		44.32
			6715		
3	Provision for resurfacing & strengthening of road (with 50mm thick BM + 50 mm thick BC) after ten years of 2 nd phase @ 750/- per sqm	Sq. mtr.	6160.0 5950	750 825	4620000.00 5082000
		+ Comm.	765 765		55.40
			6715		
				Total	15849280.00 16680880.00
					175.65
	Add 3% contingency & PE charges				475478.40 502426.00
					5.25
				Total	16324758.40 17183306.00
	Add 49% Departmental charges				7999131.616 8418890.00
					88.35
				Total	24323890.02 25602196.00
					268.65
				say	243.24 Lacs 256.00



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WATER SUPPLY QUANTITY SHEET

DOMESTIC WATER SUPPLY QUANTITY SHEET

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
1	UGT	D1	10.0	100 15
2	D1	D1a	68.0	100
3	D1	D2	19.0	100 150
4	D2	D7	35.0	100
5	D7	D7a	58.0 56	100
6	D7	D8	3.0	100
7	D8	D8a	85.0	100
8	D8	D9	37.0	100
9	D9	D9a	68.0	100
10	D9	D9b	33.0	100
11	D2	D3	8.0	100
12	D3	D3a	83.0	100
13	D3	D4	51.0	100
14	D4	D4a	73.0	100
15	D4	D5	3.0	100
16	D5	D5a	86.0	100
17	D5	D6	53.0	100
18	D6	D6a	91.0	100
19	D6	D6b	12.0	100
			849	



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150mm x 29m say 30m
100mm x 819m say 820m

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ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
FLUSHING WATER SUPPLY QUANTITY SHEET				
1	STP	F1	10.0	100
2.	F1	F1a	17.0	100
3.	F1	F1b	30.0	100
4.	F1b	F2	46.0	100
5.	F2	F7	23.0	100
6.	F7	F7a	51.0	100
7.	F7	F8	16.0	100
8.	F8	F8a	97.0	100
9.	F8	F9	37.0	100
10.	F9	F9a	82.0	100
11.	F9	F9b	25.0	100
12.	F2	F3	30.0	100
13.	F3	F3a	78.0	100
14.	F3	F4	46.0	100
15.	F4	F4a	81.0	100
16.	F4	F4b	80.0	100
17.	F4	F5	41.0	100
18.	F5	F5a	95.0	100
19.	F5	F6	23.0	100
			908	



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S.No.	Line No		Length of Pipe	Dia of Pipe
	From	To	mtr.	mtr.
TUBE WELL WATER SUPPLY QUANTITY SHEET				
1	TUBE WELL-01	T1	94.0	100
2.	TUBE WELL-02	T1	5.0	100
3.	T1	UGT	10.0	150
HUDA WATER SUPPLY QUANTITY SHEET				
1	MUNICIPAL LINE	UGT	130.0	100
Description			Length in (MTR)	Pipe Dia (MM)
Domestic & Tube Well Water Supply line			Dom + FLH + T.W (820 + 908 + 99) + 883 = 1830	100
Domestic & Tube Well Water Supply line			30 + 10 = 40	150
Description			Length in (MTR)	Pipe Dia (MM)
Municipal Water Supply line			130.0	100
100 Dia Valve			15	Nos.
100 Dia Non Return Valve			3	Nos.
Air Valve			6	Nos.



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ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

TITLE - SEWERAGE QUANTITY SHEET

S.No.	Line No.		Length	Pipe Dia		Depth			EXCAVATION			
						Start	End	Avg.	0.0 - 1.5	1.5 - 3.0	3.0 - 4.5	4.5 - 6.0
	From	To	(mtr.)	(mm)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1	S1	S2	97.0	200	0.200	1.40	1.70	1.55	0.0	97.0	0.0	0.0
2	S2a	S2	21.0	200	0.200	1.20	1.26	1.23	21.0	0.0	0.0	0.0
3	S2	S3	41.0	200	0.200	1.70	1.82	1.76	0.0	41.0	0.0	0.0
4	S3a	S3	83.0	200	0.200	1.20	1.46	1.33	83.0	0.0	0.0	0.0
5	S3b	S3	76.0	200	0.200	1.20	1.43	1.32	76.0	0.0	0.0	0.0
6	S3	S4	48.0	200	0.200	1.82	1.97	1.90	0.0	48.0	0.0	0.0
7	S4a	S4	76.0	200	0.200	1.20	1.43	1.32	76.0	0.0	0.0	0.0
8	S4	S5	9.0	200	0.200	1.97	2.00	1.99	0.0	9.0	0.0	0.0
9	S5a	S5	49.0	200	0.200	1.20	1.35	1.28	49.0	0.0	0.0	0.0
10	S5	S6	23.0	200	0.200	2.00	2.07	2.04	0.0	23.0	0.0	0.0
11	S8	S9	83.0	200	0.200	1.20	1.46	1.33	83.0	0.0	0.0	0.0
12	S9a	S9	28.0	200	0.200	1.20	1.29	1.24	28.0	0.0	0.0	0.0
13	S9	S10	39.0	200	0.200	1.46	1.58	1.52	0.0	39.0	0.0	0.0
14	S10a	S10	92.0	200	0.200	1.20	1.48	1.34	92.0	0.0	0.0	0.0
15	S10	S11	17.0	200	0.200	1.58	1.63	1.60	0.0	17.0	0.0	0.0
16	S11a	S11	50.0	200	0.200	1.10	1.25	1.18	50.0	0.0	0.0	0.0
17	S11	S6	22.0	200	0.200	1.63	1.70	1.66	0.0	22.0	0.0	0.0
18	S6	S7	75.0	250	0.250	2.12	2.30	2.21	0.0	75.0	0.0	0.0
19	S7a	S7	19.0	200	0.200	1.20	1.26	1.23	19.0	0.0	0.0	0.0
20	S7	STP	15.0	250	0.250	2.30	2.33	2.31	0.0	15.0	0.0	0.0
Total			963.0						577.0	386.0	0.0	0.0

Excavation Depth				
Description	(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)	(4.5 - 6.0)
200 mm Dia pipe	577.0	296.0	0.0	0.0
250 mm Dia pipe	0.0	90.0	0.0	0.0



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TITLE : STORM WATER QUANTITY SHEET											
S.No.	Line No.		Length	Size of Pipe		Depth			EXCAVATION		
						Start	End	Avg.	0.0 -1.5	1.5 - 3.0	3.0 - 4.5
	From	To	(mtr.)	(mm)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)	(mtr.)
1.	A1	A2	87.0	400	0.400	1.20	1.37	1.29	87.0	0.0	0.0
2.	A2a	A2	19.0	400	0.400	1.20	1.24	1.22	19.0	0.0	0.0
3.	A2	D.C.01	9.0	400	0.400	1.37	1.39	1.38	9.0	0.0	0.0
4.	D.C.01	R.P.01	2.0	400	0.400	1.39	1.40	1.39	2.0	0.0	0.0
5.	R.P.01	A3	3.0	400	0.400	1.20	1.21	1.20	3.0	0.0	0.0
6.	A3	A4	37.0	400	0.400	1.21	1.28	1.24	37.0	0.0	0.0
7.	A4a	A4	85.0	400	0.400	1.20	1.37	1.29	85.0	0.0	0.0
8.	A4b	A4	73.0	400	0.400	1.20	1.35	1.27	73.0	0.0	0.0
9.	A4	D.C.02	3.0	400	0.400	1.37	1.38	1.37	3.0	0.0	0.0
10.	D.C.02	R.P.02	2.0	400	0.400	1.38	1.38	1.38	2.0	0.0	0.0
11.	R.P.01	A5	5.0	400	0.400	1.20	1.21	1.21	5.0	0.0	0.0
12.	A5	A6	32.0	400	0.400	1.21	1.27	1.24	32.0	0.0	0.0
13.	A8	A9	76.0	400	0.400	1.20	1.35	1.28	76.0	0.0	0.0
14.	A9a	A9	33.0	400	0.400	1.20	1.27	1.23	33.0	0.0	0.0
15.	A9	A10	38.0	400	0.400	1.35	1.43	1.39	38.0	0.0	0.0
16.	A10a	A10	58.0	400	0.400	1.20	1.32	1.26	58.0	0.0	0.0
17.	A10b	A10	84.0	400	0.400	1.20	1.37	1.28	84.0	0.0	0.0
18.	A10	A11	39.0	400	0.400	1.43	1.51	1.47	39.0	0.0	0.0
19.	A11a	A11	79.0	400	0.400	1.20	1.36	1.28	79.0	0.0	0.0
20.	A11	D.C.03	2.0	400	0.400	1.51	1.51	1.51	0.0	2.0	0.0
21.	D.C.03	R.P.03	2.0	400	0.400	1.51	1.51	1.51	0.0	2.0	0.0
22.	R.P.03	A6	7.0	400	0.400	1.20	1.21	1.21	7.0	0.0	0.0
23.	A6	A7	85.0	400	0.400	1.27	1.44	1.36	85.0	0.0	0.0
24.	A7	D.C.04	2.0	400	0.400	1.44	1.45	1.45	2.0	0.0	0.0
25.	A12	A13	72.0	400	0.400	1.20	1.34	1.27	72.0	0.0	0.0
26.	A13	D.C.04	14.0	400	0.400	1.34	1.37	1.36	14.0	0.0	0.0
27.	D.C.04	R.P.04	3.0	400	0.400	1.45	1.45	1.45	3.0	0.0	0.0
28.	R.P.04	Over Flow To HUDA	25.0	400	0.400	1.40	1.00	1.20	25.0	0.0	0.0
Total			976.0						972.0	4.0	0.0
Excavation Depth											
Description			(0.0 - 1.5)	(1.5 - 3.0)	(3.0 - 4.5)						
400 mm Dia pipe			972.0	4.0	0.0						

PARADISE CONSULTANTS



For AARIZE TOWNSHIP LLP

Authorised Signatory



For AARIZE TOWNSHIP LLP

Authorised Signatory

PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES
SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

TITLE : ROAD QUANTITY SHEET							
AREA OF METALLED ROAD							
S.No.	Road No.	ROW (a)	Carriageway Width (b)	FootPath Width (c) (1.75m both side)	Length (d)	Carriageway Area (b*d)	Carriageway Area (c*d)
-	-	(m)	(m)	(m)	(m)	(sqm)	(sqm)
1.	R1a	9	5.50	3.50	25.00	137.50	87.50
2.	R1	9	5.50	3.50	115.00	632.50	402.50
3.	R2	10	5.50	3.50	210.00	1365.00 1155	735.00
4.	R3	9	5.50	3.50	85.00	467.50	297.50
5.	R4	9	5.50	3.50	90.00	495.00	315.00
6.	R5	9	5.50	3.50	75.00	412.50	262.50
7.	R6	9	5.50	3.50	90.00	495.00	315.00
8.	R7	9	5.50	3.50	50.00	275.00	175.00
9.	R8	9	5.50	3.50	80.00	440.00	280.00
10.	R9	9	5.50	3.50	80.00	440.00	280.00
11.	R10	9	5.50	3.50	80.00	440.00	280.00
TOTAL					980.00	5600.00 5290	3430.00
ADD 10% FOR CURVES					98.00	500.00 592.9	343.00
TOTAL					1078.00	6100.00 5929	3773.00
SAY					1078.00	6100.00 5929	3773.00



For AARIZE TOWNSHIP LLP


Authorised Signatory



For AARIZE TOWNSHIP LLP


Authorised Signatory

PROJECT : PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL.

TITLE : HYDRAULIC DESIGN CHART FOR MUNICIPAL WATER SUPPLY CONNECTION LINE FROM HUDA

S.No	Line No.		Average Demand		Peak Demand @ 1.5 Times	Flow Rate	Pipe Length	Head Loss	Total Head Loss	Velocity	Pipe Dia
	From	To	kld.	kl/hr.	lph.	lpm.	mtr.	mtr./ mtr.	mtr.	m/sec	mm
1	HUDA	UGT.	306.31	13.9	20.9	348.1	130.0	0.011	1.47	0.738	100

Note : HUDA supply line calculation has been done as / 22 hours.

For AARIZE TOWNSHIP

Authorised Signatory



For AARIZE TOWNSHIP LLP

Authorised Signatory

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PROJECT : PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

S.No.	Line No.	Average Demand	Flow Rate	Length	Head Loss	Total Head Loss	Velocity	Pipe Dia
	From	To	lpm.	mtr.	mtr./ mtr.	mtr.	m/sec	mm
1	TUBE WELL-01	T1	416.67	94.0	0.016	1.48	0.884	100
2	TUBE WELL-02	T1	416.67	5.0	0.016	0.08	0.884	100
3	T1	UGT	833.33	10.0	0.008	0.08	0.786	150

For AARIZE TOWNSHIP LLP

Authorised Signatory



For AARIZE TOWNSHIP LLP

Authorised Signatory



PARADISE CONSULTANTS

PROJECT : PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL

(Pump Riser Calculation Sheet)

Domestic Water Supply Design Calculation For Plots, Commercial, Community Building																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
S. No.	Line No.	Plot	Population	LPCD	Visitors @10 %	Non Residential	Total Demand	Probable demand (lps)	Probable demand (cum/hr)	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length fits (%)	Eq. Length (mtr.)	Total length (mtr.)	Head loss line (mtr.)	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available at ground level	Residual Head Available at Ground LVL
1	UGT	D1	0	0	0	0	0	13.111	47.20	100	0.043	10.0	5	0.50	10.50	0.450	0.450	1.668	35.00	34.55
2	D1	D1a	162	16362	81.0	0	16443	0.761	2.74	100	0.000	68.0	5	3.40	71.40	0.016	0.466	0.097	34.55	34.53
3	D1	D2	36	3636	18.0	0	3654	12.350	44.46	100	0.038	19.0	5	0.95	19.95	0.765	1.215	1.572	34.55	33.78
4	D2	D7	0	0	0.0	0	0	5.244	18.88	100	0.008	35.0	5	1.75	36.75	0.289	1.504	0.667	33.78	33.50
5	D7	D7a	216	21816	108.0	0	21924	1.015	3.65	100	0.000	58.0	5	2.90	60.90	0.023	1.527	0.129	33.50	33.47
6	D7	D8	0	0	0.0	0	0	4.229	15.23	100	0.005	3.0	5	0.15	3.15	0.017	1.520	0.538	33.50	33.48
7	D8	D8a	396	39996	198.0	0	40194	1.861	6.70	100	0.001	85.0	5	4.25	89.25	0.103	1.623	0.237	33.48	33.38
8	D8	D9	0	0	0.0	0	0	2.368	8.53	100	0.002	37.0	5	1.85	38.85	0.070	1.590	0.301	33.48	33.41
9	D9	D9a	324	32724	162.0	0	32886	1.523	5.48	100	0.001	68.0	5	3.40	71.40	0.057	1.647	0.194	33.41	33.35
10	D9	D9b	180	18180	90.0	0	18270	0.846	3.05	100	0.000	33.0	5	1.65	34.65	0.009	1.600	0.108	33.41	33.40
11	D2	D3	0	0	0.0	0	0	6.936	24.97	100	0.013	8.0	5	0.40	8.40	0.111	1.326	0.883	33.78	33.67
12	D3	D3a	288	29088	144.0	0	29232	1.353	4.87	100	0.001	83.0	5	4.15	87.15	0.056	1.382	0.172	33.67	33.62
13	D3	D4	0	0	0.0	0	0	5.583	20.10	100	0.009	51.0	5	2.55	53.55	0.472	1.798	0.710	33.67	33.20
14	D4	D4a	270	27270	135.0	0	27405	1.269	4.57	100	0.001	73.0	5	3.65	76.65	0.043	1.842	0.161	33.20	33.16
15	D4	D5	0	0	0.0	0	0	4.314	15.53	100	0.005	3.0	5	0.15	3.15	0.017	1.815	0.549	33.20	33.18
16	D5	D5a	306	30906	153.0	0	31059	1.438	5.18	100	0.001	86.0	5	4.30	90.30	0.065	1.880	0.183	33.18	33.12

For AARIZE TOWNSHIP LLP



Authorised Signatory

PARADISE CONSULTANTS

Authorised

Signature

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
S. No.	Line No.	Plot	Population	LPCD	Visitors @10 %	Non Residential	Total Demand	Probable demand (lps)	Probable demand (cum/hr)	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length fits (%)	Eq. Length (mtr.)	Total length (mtr.)	Head loss line (mtr.)	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available at ground level	Residual Head Available at Ground LVL
17.	D5 D6	7	126	12726	63.0	0	12789	2.876	10.35	100	0.003	53.0	5	2.65	55.65	0.144	1.959	0.366	33.18	33.04
18.	D6	25	450	45450	225.0	0	45675	2.115	7.61	100	0.001	91.0	5	4.55	95.55	0.140	2.099	0.269	33.04	32.90
19.	D6	2	36	3636	18.0	8	3662	0.170	0.61	100	0.000	12.0	5	0.60	12.60	0.000	1.959	0.022	33.04	33.04

Flow Rate 13.111 lps

or 786.6 LPM

No. of Pumps (2 W + 1 S)

393.3 LPM

Say

400.0 LPM

Maximum Building Height

21 m

Pump Head

35.00 m

Pump HP

5.10 HP

Say

6.00 HP

For AARIZE TOWNSHIP LLP

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
S. No.	Line No.	Plot	Population	LPCD	Visitors @10 %	Non Residential	Total Demand	Probable demand (lps)	Probable demand (cum/hr)	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length (mtr.)	Eq. Length (mtr.)	Total length (mtr.)	Head loss line (mtr.)	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available at ground level	Residual Head Available at Ground LVL
Flushing Water Supply Design Calculation For Plots, Commercial, Community Building																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
S. No.	Line No.	Plot	Population	LPCD	Visitors @10 %	Non Residential	Total Demand	Probable demand (lps)	Probable demand (cum/hr)	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length (mtr.)	Eq. Length (mtr.)	Total length (mtr.)	Head loss line (mtr.)	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available at ground level	Residual Head Available at Ground LVL
-	-	-	18	54.25	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	STP	F1	0	0	0	0	0	7.137	25.69	100	0.014	10.0	5	0.50	10.50	0.146	0.146	0.908	35.00	34.85
2	F1	F1a	3	2929.5	54.0	0	2984	0.138	0.50	100	0.000	17.0	5	0.85	17.85	0.000	0.146	0.018	34.85	34.85
3	F1	F1b	4	3906	72.0	0	3978	6.999	25.19	100	0.013	30.0	5	1.50	31.50	0.422	0.568	0.891	34.85	34.43
4	F1b	F2	4	3906	72.0	0	3978	6.814	24.53	100	0.013	46.0	5	2.30	48.30	0.616	1.184	0.867	34.43	33.82
5	F2	F7	0	0	0.0	0	0	2.855	10.28	100	0.003	23.0	5	1.15	24.15	0.061	1.246	0.363	33.82	33.75
6	F7	F7a	12	11718	216.0	0	11934	0.553	1.99	100	0.000	51.0	5	2.55	53.55	0.007	1.252	0.070	33.75	33.75
7	F7	F8	0	0	0.0	0	0	2.302	8.29	100	0.002	16.0	5	0.80	16.80	0.029	1.274	0.293	33.75	33.73
8	F8	F8a	22	21483	396.0	0	21879	1.013	3.65	100	0.000	97.0	5	4.85	101.85	0.038	1.312	0.129	33.73	33.69
9	F8	F9	0	0	0.0	0	0	1.289	4.64	100	0.001	37.0	5	1.85	38.85	0.023	1.297	0.164	33.73	33.70
10	F9	F9a	20	19530	360.0	0	19890	0.921	3.32	100	0.000	82.0	5	4.10	86.10	0.027	1.324	0.117	33.70	33.68
11	F9	F9b	8	7812	144.0	0	7956	0.368	1.33	100	0.000	25.0	5	1.25	26.25	0.002	1.299	0.047	33.70	33.70
12	F2	F3	0	0	0.0	0	0	3.776	13.59	100	0.004	30.0	5	1.50	31.50	0.135	1.319	0.480	33.82	33.68
13	F3	F3a	16	15624	288.0	0	15912	0.737	2.65	100	0.000	78.0	5	3.90	81.90	0.017	1.336	0.094	33.68	33.66
14	F3	F4	0	0	0.0	0	0	3.039	10.94	100	0.003	46.0	5	2.30	48.30	0.138	1.457	0.387	33.68	33.54
15	F4	F4a	15	14647.5	270.0	0	14918	0.691	2.49	100	0.000	81.0	5	4.05	85.05	0.016	1.472	0.088	33.54	33.53
16	F4	F4b	18	17577	324.0	0	17901	0.829	2.98	100	0.000	80.0	5	4.00	84.00	0.022	1.478	0.105	33.54	33.52

For A.C.P.L. TOWNSHIP LLP

Authorised Signatory

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
S. No.	Line No.	Plot	Population	LPCD	Visitors @10 %	Non Residential	Total Demand	Probable demand (lps)	Probable demand (cum/hr)	Assumed pipe dia. (mm)	Head loss (mtr./mtr.)	Pipe length (mtr.)	Eq. Length fits (%)	Eq. Length (mtr.)	Total length (mtr.)	Head loss line (mtr.)	Head loss prog (mtr.)	Velocity (m/sec)	Pump Head Available at ground level	Residual Head Available at Ground LVL
17.	F4	F5	72	3906	72.0	0	3978	1.520	5.47	100	0.001	41.0	5	2.05	43.05	0.034	1.491	0.193	33.54	33.51
18.	F5	F5a	450	24412.5	450.0	0	24863	1.151	4.14	100	0.000	95.0	5	4.75	99.75	0.047	1.538	0.146	33.51	33.48
19.	F5	F6	72	3906	72.0	4	3982	0.184	0.66	100	0.000	23.0	5	1.15	24.15	0.000	1.491	0.023	33.51	33.51

Flow Rate

7.137 lps

or

428.2 LPM

No. of Pumps (1 W + 1 S)

428.2 LPM

Say

430.0 LPM

Maximum Building Height

21 m

Pump Head

35.00 m

Pump HP

5.6 HP

Say

6.0 HP

For AARIZE TOWNSHIP LLP

Authorised Signatory

For AARIZE TOWNSHIP LLP

Authorised Signatory



PARADISE CONSULTANTS

PROJECT : PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL.

TITLE : HYDRAULIC SEWAGE DESIGN CHART

S.No	Line No.		Gross Water Requirement (Load on Line)	Sewage Flow (Self Load on Line) LPHD	Sewage Flow (Self Load on Line) KLD	Previous Load	Progressive Discharge (kld)	Progressive Discharge (Average)	Progressive Discharge (Peak)	Infiltration @ 25% Av. Discharge	Total Discharge	Length (mtr)	Pipe Size dia (mm)	Slope (1 in)	Fall (mtr)	Velocity (m/s) (v)	Capacity of Pipe	Levels at start (mtr)						Levels at End (mtr)						Manhole Start Depth	Manhole End Depth	Average Depth		
	From	To																FRL	ISL	IL	FRL	ISL	IL	FRL	ISL	IL	FRL	ISL	IL				FRL	ISL
-				100% & 80%	1000	kld	kld	lps.	lps.	lps.	lps.	(mtr)	(mm)	(mm)	(mtr)	(m/s) (v)	lps.	lps.	242.55	242.35	242.05	242.25	242.05	242.25	242.05	242.25	242.05	242.25	242.05	242.25	242.05	1.40	1.70	1.55
1.	S1	S2	70561	61524	61.52	0.00	61.52	0.71	2.14	0.18	2.31	97.0	200	325	0.30	0.75	23.66	23.66	242.55	242.35	242.05	242.25	242.05	242.25	242.05	242.25	242.05	242.25	242.05	242.25	242.05	1.40	1.70	1.55
2	S2a	S2	5643	4920	4.92	0.00	4.92	0.06	0.17	0.01	0.19	21.0	200	325	0.06	0.75	23.66	23.66	242.75	242.35	242.05	242.69	242.35	242.69	242.35	242.69	242.35	242.69	242.35	242.69	242.35	1.20	1.26	1.23
3	S2	S3	16929	14761	14.76	66.44	81.21	0.94	2.82	0.23	3.05	41.0	200	325	0.13	0.75	23.66	23.66	242.75	242.05	242.05	242.13	242.05	242.13	242.05	242.13	242.05	242.13	242.05	242.13	1.70	1.82	1.76	
4	S3a	S3	42323	36902	36.90	0.00	36.90	0.43	1.28	0.11	1.39	83.0	200	325	0.26	0.75	23.66	23.66	242.75	242.35	242.05	242.49	242.35	242.49	242.35	242.49	242.35	242.49	242.35	242.49	1.20	1.46	1.33	
5	S3b	S3	47966	41823	41.82	0.00	41.82	0.48	1.45	0.12	1.57	76.0	200	325	0.23	0.75	23.66	23.66	242.75	242.35	242.05	242.52	242.35	242.52	242.35	242.52	242.35	242.52	242.35	242.52	1.20	1.43	1.32	
6	S3	S4	2822	2460	2.46	159.93	162.39	1.88	5.64	0.47	6.11	48.0	200	325	0.15	0.75	23.66	23.66	242.75	242.35	241.93	241.98	242.35	241.98	242.35	241.98	242.35	241.98	242.35	241.98	1.82	1.97	1.90	
7	S4a	S4	25394	22141	22.14	0.00	22.14	0.26	0.77	0.06	0.83	76.0	200	325	0.23	0.75	23.66	23.66	242.75	242.35	241.98	242.52	242.35	242.52	242.35	242.52	242.35	242.52	242.35	242.52	1.20	1.43	1.32	
8	S4	S5	2822	2460	2.46	184.53	186.99	2.16	6.49	0.54	7.03	9.0	200	325	0.03	0.75	23.66	23.66	242.75	242.35	241.78	241.95	242.75	241.95	242.75	241.95	242.75	241.95	242.75	241.95	1.99	2.00	1.99	
9	S5a	S5	14108	12301	12.30	0.00	12.30	0.14	0.43	0.04	0.46	49.0	200	325	0.15	0.75	23.66	23.66	242.75	242.35	241.98	242.55	242.75	242.55	242.75	242.55	242.75	242.55	242.75	242.55	1.97	2.00	1.99	
10	S5	S6	2822	2460	2.46	199.29	201.75	2.34	7.01	0.58	7.59	23.0	200	325	0.07	0.75	23.66	23.66	242.75	242.35	241.75	241.95	242.75	241.95	242.75	241.95	242.75	241.95	242.75	241.95	2.00	2.07	2.04	
11	S8	S9	53609	46743	46.74	0.00	46.74	0.54	1.62	0.14	1.76	83.0	200	325	0.26	0.75	23.66	23.66	242.75	242.35	241.78	242.55	242.75	242.55	242.75	242.55	242.75	242.55	242.75	242.55	1.20	1.46	1.33	
12	S9a	S9	16929	14761	14.76	0.00	14.76	0.17	0.51	0.04	0.56	28.0	200	325	0.09	0.75	23.66	23.66	242.75	242.35	241.78	242.55	242.75	242.55	242.75	242.55	242.75	242.55	242.75	242.55	1.20	1.29	1.24	
13	S9	S10	8465	7380	7.38	61.50	68.88	0.80	2.39	0.20	2.59	39.0	200	325	0.12	0.75	23.66	23.66	242.75	242.35	241.78	242.55	242.75	242.55	242.75	242.55	242.75	242.55	242.75	242.55	1.46	1.58	1.52	
14	S10a	S10	62073	54123	54.12	0.00	54.12	0.63	1.88	0.16	2.04	92.0	200	325	0.28	0.75	23.66	23.66	242.75	242.35	241.78	242.55	242.75	242.55	242.75	242.55	242.75	242.55	242.75	242.55	1.20	1.48	1.34	
15	S10	S11	0	0	0.00	123.01	123.01	1.42	4.27	0.36	4.63	17.0	200	325	0.05	0.75	23.66	23.66	242.75	242.35	241.78	242.55	242.75	242.55	242.75	242.55	242.75	242.55	242.75	242.55	1.63	1.63	1.60	
16	S11a	S11	28227	24612	24.61	0.00	24.61	0.28	0.85	0.07	0.93	50.0	200	325	0.15	0.75	23.66	23.66	242.75	242.35	241.78	242.55	242.75	242.55	242.75	242.55	242.75	242.55	242.75	242.55	1.10	1.25	1.18	
17	S11	S6	5643	4920	4.92	147.62	152.54	1.77	5.30	0.44	5.74	22.0	200	325	0.07	0.75	23.66	23.66	242.75	242.35	241.78	242.55	242.75	242.55	242.75	242.55	242.75	242.55	242.75	242.55	1.63	1.70	1.66	
18	S6	S7	22572	19681	19.68	354.29	373.07	4.33	12.99	1.08	14.07	75.0	250	425	0.18	0.76	37.51	37.51	243.75	241.88	241.63	241.88	243.75	241.88	243.75	241.88	243.75	241.88	243.75	241.88	2.30	2.30	2.21	
19	S7a	S7	8465	7380	7.38	0.00	7.38	0.09	0.26	0.02	0.28	19.0	200	325	0.06	0.75	23.66	23.66	243.75	242.75	242.55	242.75	243.75	242.75	243.75	242.75	243.75	242.75	243.75	242.75	1.20	1.26	1.23	
20	S7	STP	0	0	0.00	381.35	381.35	4.41	13.24	1.10	14.34	15.0	250	425	0.04	0.76	37.51	37.51	243.75	241.70	241.45	241.70	243.75	241.70	243.75	241.70	243.75	241.70	243.75	241.70	2.33	2.33	2.31	

Formula Used:

Velocity (m/s) = $(1/n) \times (A/P)^{2/3} \times (1/\text{slope})^{1/5}$

n=0.01 for DWVC drain pipe (Manning's Coefficient)

A=Area of section of pipe in sqm

P=Wetted Perimeter in m

Capacity of pipe (lps) = Area of section of pipe in sqm x velocity in m/s x 1000 x 1/2 (Sewerage system are designed to run half flow)

Abbreviation Used:

IL=Invert level of pipe

FSL=Full supply level

FRL=Formation Road Level

CL=Construction Level

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For AARIZE TOWNSHIP LLP

Authorised Signatory

PARADISE CONSULTANTS

PROJECT : PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL, SECTOR - 34, KARNAL.

LOAD ON SEWAGE LINES																		
				Residential Plots Sewage Load								Non Residential Plot Sewage Load					Residential + Non Resi. Load	
S No.	Name of Sewer Line		Plot	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	From	To	Unit	Population / persons / Plot	Domestic Water Requirement @ 101 Ltr/ day /Person	Sewage Flow (Self Load on Line) lpd.	Flushing Water Req. @ 54.25 lpd. (Sewage load 100%)	Visitors @ 10 % of Main Units	DWS @ 5 ltr/ day /Person	Sewage Flow (Self Load on Line)	PWS @ 10 ltr/ day /Person	Non Residential Buildings	Domestic Water Requirement	Sewage Load From Domestic Water (lpd.)	Sewage Load From Plumbing Water @ 100%	Gross Water Requirement (Load on Line)		
				18	101	80%	54.25	10%	5	80%	10	-	lpd.	80%	lpd.	lpd.		
1.	S1	S2	25	450	45450.0	36360.0	24412.5	45.0	225.0	281.3	450.0	Community Facility	15.3	12.2	8.2	70561.1	61524.2	61.52
2.	S2a	S2	2	36	3636.0	2908.8	1953.0	3.6	18.0	22.5	36.0	-	0.0	0.0	0.0	5643.0	4920.3	4.92
3.	S2	S3	6	108	10908.0	8726.4	5859.0	10.8	54.0	67.5	108.0	-	0.0	0.0	0.0	16929.0	14760.9	14.76
4.	S3a	S3	15	270	27270.0	21816.0	14647.5	27.0	135.0	168.8	270.0	-	0.0	0.0	0.0	42322.5	36902.3	36.90
5.	S3b	S3	17	306	30906.0	24724.8	16600.5	30.6	153.0	191.3	306.0	-	0.0	0.0	0.0	47965.5	41822.6	41.82
6.	S3	S4	1	18	1818.0	1454.4	976.5	1.8	9.0	11.3	18.0	-	0.0	0.0	0.0	2821.5	2460.2	2.46
7.	S4a	S4	9	162	16362.0	13089.6	8788.5	16.2	81.0	101.3	162.0	-	0.0	0.0	0.0	25393.5	22141.4	22.14
8.	S4	S5	1	18	1818.0	1454.4	976.5	1.8	9.0	11.3	18.0	-	0.0	0.0	0.0	2821.5	2460.2	2.46
9.	S5a	S5	5	90	9090.0	7272.0	4882.5	9.0	45.0	56.3	90.0	-	0.0	0.0	0.0	14107.5	12300.8	12.30
10.	S5	S6	1	18	1818.0	1454.4	976.5	1.8	9.0	11.3	18.0	-	0.0	0.0	0.0	2821.5	2460.2	2.46
11.	S8	S9	19	342	34542.0	27633.6	18553.5	34.2	171.0	213.8	342.0	-	0.0	0.0	0.0	53608.5	46742.9	46.74
12.	S9a	S9	6	108	10908.0	8726.4	5859.0	10.8	54.0	67.5	108.0	-	0.0	0.0	0.0	16929.0	14760.9	14.76
13.	S9	S10	3	54	5454.0	4363.2	2929.5	5.4	27.0	33.8	54.0	-	0.0	0.0	0.0	8464.5	7380.5	7.38
14.	S10a	S10	22	396	39996.0	31996.8	21483.0	39.6	198.0	247.5	396.0	-	0.0	0.0	0.0	62073.0	54123.3	54.12
15.	S10	S11	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.00
16.	S11a	S11	10	180	18180.0	14544.0	9765.0	18.0	90.0	112.5	180.0	Commercial	7.8	6.3	4.2	28227.0	24612.0	24.61
17.	S11	S6	2	36	3636.0	2908.8	1953.0	3.6	18.0	22.5	36.0	-	0.0	0.0	0.0	5643.0	4920.3	4.92
18.	S6	S7	8	144	14544.0	11635.2	7812.0	14.4	72.0	90.0	144.0	-	0.0	0.0	0.0	22572.0	19681.2	19.68
19.	S7a	S7	3	54	5454.0	4363.2	2929.5	5.4	27.0	33.8	54.0	-	0.0	0.0	0.0	8464.5	7380.5	7.38
20.	S7	STP	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.00
			155	2790	281790.0	225142.0	151357.5	279.0	1395.0	1743.8	2790.0	0.0	23.1	18.5	12.5	437368.1	381354.2	381.35

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ACPL Des. 90.0 225-42.0

For AARIZE TOWNSHIP LLP

Author:  atory

PROJECT : PROPOSED AFFORDABLE RESIDENTIAL PLOTTED COLONY UNDER DDJAY-2016 OVER AN AREA MEASURING 9.4166 ACRES SITUATED IN THE REVENUE ESTATE OF VILLAGE KARNAL,
SECTOR - 34, KARNAL

TITLE : HYDRAULIC STORM WATER DESIGN CHART

TITLE : HYDRAULIC STORM WATER DESIGN CHART																					
S No.	Line No.		Length (mtr.)	Catchment Area (Sq.m.)			Discharge @ 35 mm/hr rainfall 60% runoff (lps)	Pipe dia (mm)	Slope 1 in (mm)	Velocity m/sec.	Capacity of pipe lps.	Fall in line mtr.	Levels at start (mtr.)				Levels at End (mtr.)			Manhole Depth	
	From	To		Self	Progg.	Total							FRL	FSL	IL	FRL	FSL	IL	FRL	FSL	IL
-	A1	A2	87.0	5820.0	0.0	5820.0	33.95	400	500	0.96	121.11	0.17	243.75	242.95	242.55	243.75	242.78	242.38	1.20	1.37	1.29
1.	A2a	A2	19.0	480.0	0.0	480.0	2.80	400	500	0.96	121.11	0.04	243.75	242.95	242.55	243.75	242.91	242.51	1.20	1.24	1.22
2.	A2	D.C.01	9.0	230.0	6300.0	6530.0	38.09	400	500	0.96	121.11	0.02	243.75	242.78	242.38	243.75	242.76	242.36	1.37	1.39	1.38
3.	D.C.01	R.P.01	2.0	0.0	6530.0	6530.0	38.09	400	500	0.96	121.11	0.00	243.75	242.76	242.36	243.75	242.75	242.35	1.39	1.40	1.39
4.	R.P.01	A3	3.0	0.0	3265.0	3265.0	19.05	400	500	0.96	121.11	0.01	243.75	242.95	242.55	243.75	242.94	242.54	1.20	1.21	1.20
5.	A3	A4	37.0	930.0	3265.0	4195.0	24.47	400	500	0.96	121.11	0.07	243.75	242.94	242.54	243.75	242.87	242.47	1.21	1.28	1.24
6.	A4a	A4	85.0	3830.0	0.0	3830.0	22.34	400	500	0.96	121.11	0.17	243.75	242.95	242.55	243.75	242.78	242.38	1.20	1.37	1.29
7.	A4b	A4	73.0	4790.0	0.0	4790.0	27.94	400	500	0.96	121.11	0.15	243.75	242.95	242.55	243.75	242.80	242.40	1.20	1.35	1.27
8.	A4	D.C.02	3.0	80.0	12815.0	12895.0	75.22	400	500	0.96	121.11	0.01	243.75	242.78	242.38	243.75	242.77	242.37	1.37	1.38	1.37
9.	D.C.02	R.P.02	2.0	0.0	12895.0	12895.0	75.22	400	500	0.96	121.11	0.00	243.75	242.77	242.37	243.75	242.77	242.37	1.38	1.38	1.38
10.	R.P.01	A5	5.0	0.0	3265.0	3265.0	19.05	400	500	0.96	121.11	0.01	243.75	242.95	242.55	243.75	242.94	242.54	1.20	1.21	1.21
11.	A5	A6	32.0	800.0	3265.0	4065.0	23.71	400	500	0.96	121.11	0.06	243.75	242.94	242.54	243.75	242.88	242.48	1.21	1.27	1.24
12.	A8	A9	76.0	3040.0	0.0	3040.0	17.73	400	500	0.96	121.11	0.15	243.75	242.95	242.55	243.75	242.80	242.40	1.20	1.35	1.28
13.	A9a	A9	33.0	1490.0	0.0	1490.0	8.69	400	500	0.96	121.11	0.07	243.75	242.95	242.55	243.75	242.88	242.48	1.20	1.27	1.23
14.	A9	A10	38.0	380.0	4530.0	4910.0	28.64	400	500	0.96	121.11	0.08	243.75	242.80	242.40	243.75	242.72	242.32	1.35	1.43	1.39
15.	A10a	A10	58.0	2610.0	0.0	2610.0	15.23	400	500	0.96	121.11	0.12	243.75	242.95	242.55	243.75	242.83	242.43	1.20	1.32	1.26
16.	A10b	A10	84.0	3360.0	0.0	3360.0	19.60	400	500	0.96	121.11	0.17	243.75	242.95	242.55	243.75	242.78	242.38	1.20	1.37	1.28
17.	A10	A11	39.0	390.0	10880.0	11270.0	65.74	400	500	0.96	121.11	0.08	243.75	242.95	242.55	243.75	242.64	242.24	1.43	1.51	1.47
18.	A11a	A11	79.0	2680.0	0.0	2680.0	15.63	400	500	0.96	121.11	0.16	243.75	242.95	242.55	243.75	242.79	242.39	1.20	1.36	1.28
19.	D.C.03	D.C.03	2.0	100.0	13950.0	14050.0	81.96	400	500	0.96	121.11	0.00	243.75	242.64	242.24	243.75	242.64	242.24	1.51	1.51	1.51
20.	D.C.03	R.P.03	2.0	0.0	14050.0	14050.0	81.96	400	500	0.96	121.11	0.00	243.75	242.64	242.24	243.75	242.64	242.24	1.51	1.51	1.51
21.	D.C.03	R.P.03	2.0	0.0	14050.0	14050.0	81.96	400	500	0.96	121.11	0.00	243.75	242.64	242.24	243.75	242.64	242.24	1.51	1.51	1.51



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Manhole Depth																					
S. No.	Line No.		Length (mtr.)	Catchment Area (Sq.m.)			Discharge @ 35 mm/hr rainfall 60% runoff (lps)	Pipe dia (mm)	Slope 1 in (mm)	Velocity m/sec.	Capacity of pipe lps.	Fall in line mtr.	Levels at start (mtr.)				Levels at End (mtr.)			Avg. Depth	
	From	To		Self	Progg.	Total							FRL	FSL	IL	FRL	FSL	IL	Start		End
22.	R.P.03	A6	7.0	0.0	7025.0	7025.0	40.98	400	500	0.96	121.11	0.01	243.75	242.95	242.55	243.75	242.94	242.54	1.20	1.21	1.21
23.	A6	A7	85.0	2550.0	11090.0	13640.0	79.57	400	500	0.96	121.11	0.17	243.75	242.88	242.48	243.75	242.71	242.31	1.27	1.44	1.36
24.	A7	D.C.04	2.0	60.0	13640.0	13700.0	79.92	400	500	0.96	121.11	0.00	243.75	242.71	242.31	243.75	242.70	242.30	1.44	1.45	1.45
25.	A12	A13	72.0	3560.0	0.0	3560.0	20.77	400	500	0.96	121.11	0.14	243.75	242.95	242.55	243.75	242.81	242.41	1.20	1.34	1.27
26.	A13	D.C.04	14.0	420.0	3560.0	3980.0	23.22	400	500	0.96	121.11	0.03	243.75	242.81	242.41	243.75	242.78	242.38	1.34	1.37	1.36
27.	D.C.04	R.P.04	3.0	0.0	17680.0	17680.0	103.13	400	500	0.96	121.11	0.01	243.75	242.70	242.30	243.75	242.70	242.30	1.45	1.45	1.45
28.	R.P.04	Over Flow To HUDA	25.0	0.0	8840.0	8840.0	51.57	400	500	0.96	121.11	0.05	243.75	242.75	242.35	243.30	242.70	242.30	1.40	1.00	1.20

Formula Used:

Velocity (m/s) = $(1/n) \times (A/P)^{2/3} \times (1/\text{slope})^{0.5}$

n = 0.01 for DWCP pipe (Manning's Coefficient)

A = Area of x-section of pipe in sqm.

P = Wetted Perimeter in m

Capacity of pipe (lps) = Area of x-section of pipe in sqm x velocity in m/s x 1000 x 1/2 (Storm water are designed to run full flow)

Abbreviation Used:

IL = Invert level of pipe

FSL = Full supply level

FRL = Formation Road Level

CL = Connection Level

For AARIZE TOWNSHIP LLP



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